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ABSTRACT

The development and implementation of a behavior modification plan based on token learning schemes is described for use in teaching basic computational skills to low ability, poorly motivated fifth graders. The token system with its reward schedule is outlined; reinforcing activities such as team games, quizzes, and drills are discussed. A brief case study typical of the group is presented. (Author/DT)

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A BEHAVIOR MODIFICATION PLAN FOR AIDING SLOW LEARNERS IN ARITHMETIC

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ABSTRACT

A class of fifth graders were targeted for special help in basic computational skills. The students were alleged to have extremely low motivation to do any work in class coupled with less than average ability. Under the circumstances of poor motivation, low ability, and a history of failure in arithmetic, a new approach to learning was sought. A behavior modification plan based on token learning schemes was developed and implemented with a remarkable amount of success.

The token system with its reward schedule is outlined. Reinforcing activities such as team games, quizzes, and novel drills are discussed. A brief case study fairly typical of the group is presented.

THE PROBLEM

Because many of the fifth graders in a school were having a difficult time in arithmetic, the students were homogenously grouped for special study. I was given a group of students labeled "slow learners" and was instructed to cover as much of the same material as the other classes as I could but at a slower rate.

The first day, I started with the execution of elementary drills. Several students didn't bother turning in papers. Many papers were torn and untidy. I decided to do some research and try to find a solution to help the students.

Most of the students were of less than average intelligence and had previous problems in arithmetic. I felt that the non-responses I was getting was basis enough to begin division over again but to try to find a new approach.

TOKEN LEARNING SYSTEM

A system worth trying involved token learning which was based on the principles of behavior modification. In order to get the students interested in learning arithmetic, their inattentive behavior and incorrect responses had to be modified. The modification of inappropriate behavior was accomplished by using tokens as a reward for responding correctly. If the tokens themselves are not enough incentive to learn, the tokens are to be redeemed each week for some bigger prize. At first, it is important to reward almost all

the behavior of the students with token giving. Then little by little, a teacher should shape the type of responses and behavior he wants. There is a gradual extinction of unwanted responses such as inattention and sloppy work. Desirable skills are reinforced (rewarded) and shaped. It is important to administer this process gradually so that the student can successfully learn the skills necessary for reward. Under the token system, a student is never punished for non-learning; he merely does not receive a reward and hopefully soon learns which behavior to avoid so as not to go unrewarded.

Schedule of Reinforcement

How often should students be rewarded? The schedule of reinforcement was a mixture of fixed interval and fixed ratio. I decided to reward the students each Friday by allowing them to redeem their tokens. Tokens were received daily. This corresponds to a fixed interval schedule. However, the receipt of reward was actually dependent on the amount of tokens which was dependent on a fixed amount of responses in arithmetic. Thus, this was a fixed ratio which was a desirable one to use since it usually produces rapid rates of responding.

Tokens

Tokens that would interest most of the students were used. The boys received miniature pictures of baseball players that were sticky and easily pasted in a record keeping book that

they had to check their progress. The girls received the same types of tokens but pictures of animals instead. The children had to keep a daily and weekly account of tokens and plot their progress on a chart as I plotted their cumulative progress on a chart at the front of the room.

I decided to use a daily monitor to help distribute tokens and to make sure to give out the correct amount and take daily totals. This would give them a sense of responsibility and extra practice in arithmetic skills. The monitor received an extra token for a reward.

Reward and Redemption

The reward I decided on was a pizza and coke party each Friday afternoon. Pizza was worth twenty-seven (27) tokens and coke was worth nineteen (19) tokens per glass. Friday's monitor helped me redeem tokens by taking orders of pizza and coke from each student first checking to see whether the student had enough tokens to redeem.

I talked to each student and asked them what they intended to order posing such questions as, "Do you know how many tokens it would take to get a whole pizza at once?", "How many weeks would it take?", "Do you have enough for two slices and one glass of coke or just one slice and coke?", "How many tokens would you need to get another slice?", etc. Practical application was the key here.

My Friday monitor also had another job of adding up all the orders and figuring out at eight slices a pizza and five glasses a bottle, how much pizza and coke I had to buy.

What I had to make clear from the very beginning was that only students with enough tokens could get pizza and coke on Friday, no exceptions. But I also tried to make it possible, at least in the first week, that each student could gain at least enough for a drink.

TOKEN SCHEDULE-GENERAL GOALS

Week One

During the first week, I was mainly interested in getting the student's attention and their ability to carry out simple assignments (copy neatly from the board, easy computation). Therefore, the reward was mostly in these areas. This strategy would gain the confidence of the students that reward was quite possible.

Week Two

Feeling that they should have been rewarded enough for primary skills, I concentrated reward in carrying out computations on a higher level. I was mainly interested that the student would attempt problems and at least approximate. I no longer rewarded papers unless they were relatively neat and organized.

Week Three

This week, I was interested in developing exact computation, not merely guesses, in areas we had already covered. In new subject areas approximations were allowed but as the week progressed, I expected closer and closer answers.

Week Four

I wanted to get the children's answers not to be dependent on reward quite as much so I sparingly gave out rewards and only for the most accurate work. I hoped to be able to end the token learning system soon but continue other worthwhile methods of behavior modification. However, I knew this could not be done drastically or else the students might have taken up their old and bad academic habits.

DISTRIBUTION OF TOKENS

Each week-monitor receives one (1) token.

Maximum tokens

Attention During Class	2	2	2	1	1
Turning in Paper With Name	3	3	3	3	2
Neatness	1	1	1	2	2
Copy Accurately	3	3	3	3	3
Work Assignments Indep.	1	1	1	1	2

Week Two

Attention	1	1	1	1	1
Turning in Paper	2	2	2	2	1
Neatness	2	2	2	2	1
Copy Accurately	3	3	3	2	2
Work Assign. Indep. (Approx.)	3	3	3	3	3
Work Assign. Indep. (Accurately)	2	2	2	2	2

Week Three

Attention	1	1	0	0	0
Turning in Paper	1	1	1	1	0
Neatness	1	1	1	1	1
Copy Accurately	2	2	2	2	1
Work Assign. Indep. (Approx.)	3	3	3	3	3
Work Assign. Indep. (Accurately)	3	3	4	4	4

Week Four

Attention	0	0	0	0	0
Turning in Paper	0	0	0	0	0
Neatness	1	1	0	0	0
Copy Accurately	1	1	0	0	0
Work Assign. Indep. (Approx.)	3	3	2	2	2
Work Assign. Indep. (Accurately)	4	5	5	5	5

SPECIAL TECHNIQUES IN DAILY TEACHING

Team Games

I divided the class into five groups of four students with varying abilities in arithmetic. One part of the contest was in verbal computations. I called out problems and the first person to answer would get a point for his team. Then I presented each student with a set of five problems. After a certain amount of time, the team would get a point for each correct problem of the team members. The students in this instance would be able to first work alone but if time was left over they could help each other.

Each team member with the highest amount of points would get three tokens for their effort. To see each student was rewarded, I devised a hard problem for the teams to work on together and be able to at least gain one token.

Quizzes

In keeping with the main method to be used, I felt the students should also receive tokens for quiz work, not just the grade. Following Directions- One Token. I believe this should be rewarded because being able to read and follow directions was such an important start in accomplishment and learning.

0 -20 % correct 1 tokens

21-50 % correct 2 tokens

51-80 % correct 3 tokens

81-100% correct 4 tokens

Any student with less than 50% was able to receive extra help and could take a re-quiz for the same amount of tokens as before.

Drills

These drills were not for token reward. In the type of drill pictured in Table 1, the four answers in each row are added together and the sum is placed at the right. This gives the student good practice in the skill required and in taking sums. It is beneficial to the teacher as she has only four answers to check, not twenty. The teacher can correct such drills quickly and perhaps give the students immediate results and reinforcement especially if they

arrived at the correct answers.

TABLE 1 - Easy Scoring Drill Matrix

A $\begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array}$	$6 \div 2 = 3$	$20 \times \frac{1}{2} = 10$	$9 \times 11 = 99$
B $10\sqrt{50} = 5$	$\frac{25}{5} = 5$	$60 \times \frac{1}{4} = 15$	$8 \times 9 = 72$
C $(8 \times 3) \div 2 = 12$	$9 \times \frac{1}{9} = 1$	$(4 \times 5) + 4 = 24$	$8\sqrt{32} = 4$
D $6 \times 8 \times 2 = 96$	$3 \div \frac{30}{10} = 1$	$6 \times 9 = 54$	$9 \times 4 = 36$

A	127
B	97
C	41
D	187

MOTIVATION IN THE TOKEN SYSTEM

Motivation does not just happen--it is taught. It is the result of carefully executed procedures which provide the incentives needed to guarantee that a child will begin and carry through on learning tasks. There are many potential incentives present in every classroom. The smiles and praise of a teacher, the chance to participate in recess and games with classmates, stories, attractive materials, and the chance to select a particular favorite activity can all be good incentives if properly used.

When activities the children prefer are available as a direct consequence of a particular behavior, they are valuable incentives, or reinforcers, which can generate and sustain motivation and progress. If these same activities are available automatically, regardless of what the child may do, they have very little incentive value. The timing of the consequence and its clear relationship to a particular behavior make a crucial difference. When praise immediately follows a child's behavior. If it comes too soon or too late, it will have little or no effect -- timing is the key.

Because many reinforcing events are hard to deliver with the necessary immediacy, classrooms use a Token Exchange System to sustain a high level of motivation. As each child in the class works at various learning tasks, he is given tokens for his progress and improvement. Later, after he has accumulated several tokens in this way, he has the opportunity

to exchange them for events and activities which are important to him. These back-up activities give meaning and value to the tokens. As long as the back-ups are exciting and enjoyable, the tokens will support the child's motivation to learn and to succeed.

Tokens, in addition to being properly timed, must be delievered frequently to be most effective. When a child is faced with a new and difficult task, tokens are given often for small amounts of progress. At a later stage, as the child's skill improves, fewer tokens are needed to support progress. Consequently, the way a child earns tokens is constantly changing. At first, tokens and praise will follow a child's first attempt at holding a pencil correctly. Later, as skill increases, the tokens and praise will follow the writing of a complete sentence.

CASE STUDY

I decided to follow the progress of one student to see how the token system effected his course work. I chose Doug B., age 10, I.Q. 88. He was typical of many of the students, daydreamed in arithmetic class, yet did fairly well in other courses, especially composition and science.

Week One

Attention	0/1	1/2	0/1	0/1	1
Turning in Paper	2/3	2/3	3	1/3	2
Neatness	0	1	1	0/2	2
Copy Accurately	1/3	2/3	1/3	1/3	1/3
Work Assign. Indep.	0/1	0/1	1	1	2
Total	3/8	6/10	6/9	3/10	8/10 = 26/46

Doug seemed to be testing me on Thursday where he dropped three tokens from Wednesday's total. I think he wanted to see if I meant business concerning giving out tokens. When he saw I did, he quickly improved the quality of his work. He further saw that I strictly abided by the rules I set up (pizza, 27; coke, 19). Even though he was only one token short, he tried to order a slice and could not. He was told both by the monitor and me that he could get a glass of soda which he reluctantly did.

Week Two

Attention	1	1	1	1	1
Turning in Paper	1/2	2	2	2	1
Neatness	1/2	1/2	2	2	1
Copy Accurately	2/3	2/3	2/3	1/2	2
Work Assign. Indep. Approx.) Work Assign. Indep. Accura.)	3/5	2/5	2/5	2/5	3/5
Total	8/13	8/13	9/13	8/12	8/10 = 41/61

Token Total

41
7 From Last Week
3 Quiz
1 Team Game
52

Doug is beginning to respond to token reward although he is having problems with division, he received 20% on his quiz. I helped him with his problem and he received a 70% on the re-quiz to earn himself three tokens. He seemed to enjoy team games even though he was on one of the "losing teams." He attacked the problems with honest effort although he was a little too slow to gain points for his team. With his tokens, he "bought" 1 slice of pizza and a glass of coke.

Week Three

Attention	1	1	0	0	0
Turning in Paper	1	1	1	0	0
Neatness	1	1	1	0	2
Copy Accurately	1/2	2	2	0	2
Work Assign. Indep. Approx.) Work Assign. Indep.) Accura.	3/6	4/6	5/7	0	6/7
Total	7/11	9/11	9/11	0	8/9 = 32/42

Token Total

32
6 From Last Week
4 Quiz
1 Monitor
42

I could see that reward was paying off for Doug in a quiz score of 85%. This was a student, who a short time ago, could not motivate himself to pay attention in arithmetic class and did not care about learning. He was showing amazing progress. Because Doug did not have enough to get both food and drink, he decided to save the tokens for next week.

Week Four

Attention	0	0	0	0	0
Turning in Paper	0	0	0	0	0
Neatness	1	1	0	0	0
Copy Accurately	1	1	0	0	0
Work Assign. Indep. Approx.) Work Assign. Indep.) Accura.	2/7	5/7	10	10	10
Total	3/9	7/7	10/10	10/10	10/10 = 40/46

Token Total

40
43 Tokens from last week
3 Team Games
4 Quiz
90

During this week, as I earlier stated, I was going to be strict in giving out tokens. Doug, like many of the other students, resented this the first day but as I hoped, he worked very hard to gain the tokens. I also hoped he was working to learn the material which I think he indirectly was doing. He received four tokens for getting an 85% on the quiz. This is surely an indication that he was learning something and that the system was beneficial. Actually,

it was not only beneficial to him but to most of the class. In relation with the other classes, they were "behind" as far as where they were in the book. However, I feel they were just as advanced as the other classes as far as understanding and comprehension was concerned. I was quite pleased with the results and I hope to continue this method as long as the results were so positive.

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